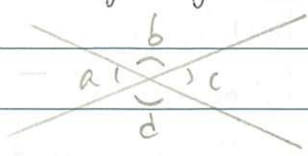
NT Ch13 Check yourself. (20/11) + (1/12)

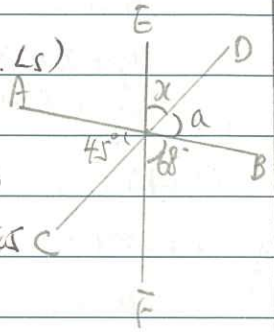
1a)



a and b are adjacent angles

a and c are vertical opposite angles

1b) $a = 45^\circ$ (vert. opp. ∠s)



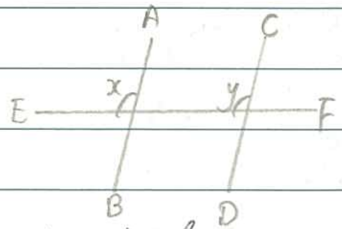
$x + a + 68 = 180$

(∠s sum of △)

$x = 180 - 68 - 45$

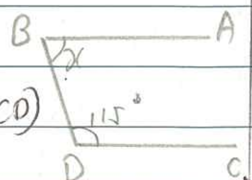
$x = 67^\circ$

2a



x and y is a pair of corresponding angles

2b $x + 115^\circ = 180^\circ$

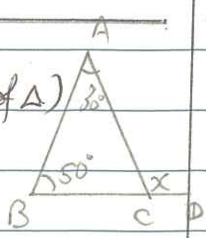


(co-int. ∠s, AB∥CD)

$x = (180 - 115)^\circ$

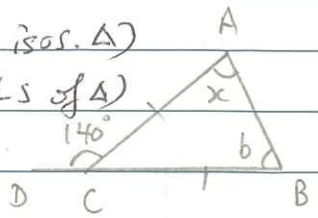
$x = 65^\circ$

3a $x = 30^\circ + 50^\circ$ (ext. ∠s of △)



$x = 80^\circ$

3b) $b = x$ (base ∠s, isos. △)

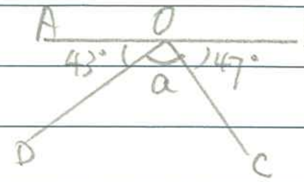


$x + b = 140^\circ$ (ext. ∠s of △)

$2x = 140^\circ$

$x = 70^\circ$

4a) To prove ∠COD is 90°



Proof:

Let ∠COD = a

∵ AOB is a straight line (given)

∴ $43^\circ + a + 47^\circ = 180^\circ$ (∠s on st. line)

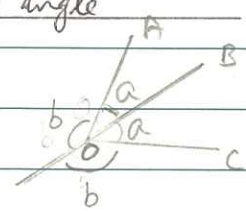
$a = 180^\circ - 43^\circ - 47^\circ$

$a = 180^\circ - 90^\circ$

$a = 90^\circ$

∴ ∠COD is a right angle

4b) To prove BOD is a straight line



Proof:

$a + a + b + b = 360^\circ$ (∠s at a pt.)

$2a + 2b = 360^\circ$

$2(a+b) = 360^\circ$

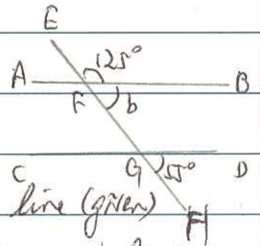
$a + b = 180^\circ$ (adj. ∠s supp)

∵ $a + b = 180^\circ$ (sum of adjacent ∠s equal 180°)

∴ DOB is a straight line

NT Ch13 Check yourself (continue)

5a) To prove $AB // CD$



Proof:

AFB is a straight line (given)

$125° + b = 180°$ (∠s on st. line)

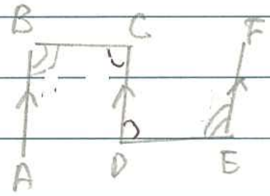
$b = 180° - 125°$

$b = 55°$

∵ $b = 55°$ (corr. ∠s eq.)

∴ $AB // CD$

5b) To prove $BC // DE$



Proof:

∵ $AB // CD$ (given)

∴ $\angle CBA + \angle BCD = 180°$ (co-int. ∠s, //s) — ①

∵ $CD // EF$ (given) — ②

∴ $\angle CDE + \angle DEF = 180°$ (co-int. ∠s, //s)

Compare equation ① and ②.

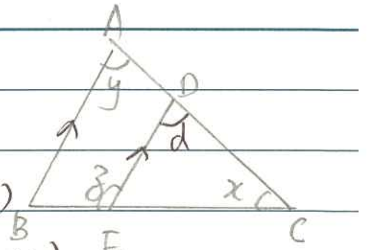
$\Rightarrow \angle CBA + \angle BCD = \angle CDE + \angle DEF$

∵ $\angle ABC = \angle DEF$ (given)

∴ $\angle BCD = \angle CDE$ (alt. ∠s, eq)

∴ $BC // DE$

6a) To prove $x + y = z$



Proof:

ADC is straight line (given)

BEC is straight line (given)

∴ ABC is a triangle

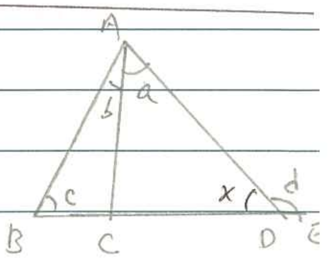
$y = d$ (corr. ∠s, $AB // DE$) — ①

$d + x = z$ (ext. ∠s of △) — ②

Sub ① into ②

$y + x = z$

6b) To prove $a + b + c = d$



Proof:

$BCDE$ is straight line (given)

∴ ABD is a triangle

$a + b + c = d$ (ext. ∠s of △)

or

$d + x = 180°$ (∠s on st. line) — ①

$a + b + c + x = 180°$ (∠s sum of △) — ②

∵ ① = ②

$a + b + c + x = d + x$

∴ $a + b + c = d$